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FRANK SHIPLEY COLLINS
MERRITT LYNDON FERNALD } Associate Editors.
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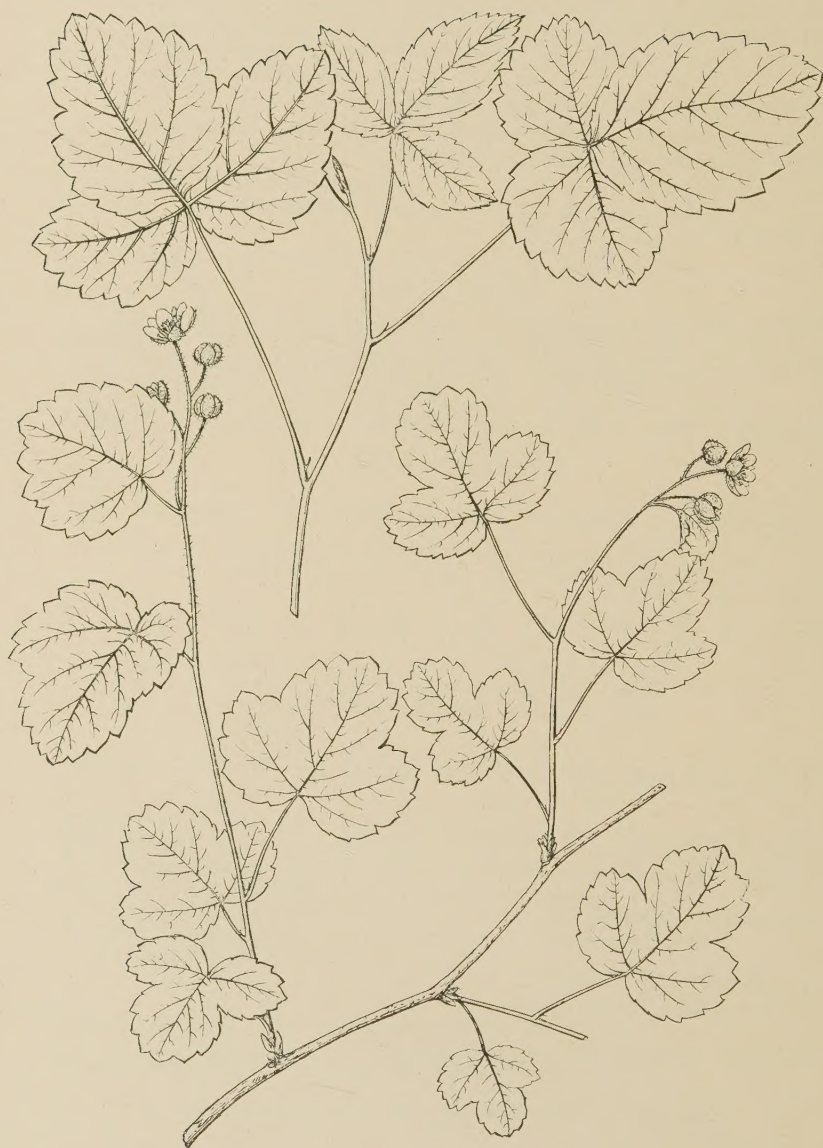
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RUBUS IDAEUS, VAR. ANOMALUS

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RUBUS IDAEUS AND ITS VARIETY ANOMALUS IN AMERICA.

M. L. FERNALD.

(Plate 20.)

EARLY in June a very remarkable *Rubus* was found by Mr. W. W. Eggleston in the crevices of limestone ledges at Cavendish, Vermont. The shrub, which is distinctly of the raspberry type, is characterized by its small roundish simple or rarely trifoliolate leaves, and at Cavendish it is associated on the ledges with another very local plant, *Arenaria macrophylla*, Hook. A careful study of the American raspberries shows Mr. Eggleston's plant to be referable to none of our described forms, but it is found, on the other hand, to be essentially identical with a very rare and much discussed *Rubus* of northern Europe, *R. idaeus*, L., var. *anomalus*, Arrhenius (*R. Leesii*, Babington).

This round-leaved raspberry is known in Europe from only a few limited stations in Scandinavia, Great Britain, Germany and Holland. Its discovery among the Green Mountains, then, is interesting as adding still another plant of northern Europe to our apparently indigenous flora. But its occurrence in America is noteworthy not merely from its geographic interest. The discovery of the plant at new stations in Europe has generally been the signal for a fresh discussion of its relationships, and these discussions have shown the variety *anomalus* to be phylogenetically one of the most significant members of the genus.

For several years the botanical journals of northern Europe contained extended articles and notes upon this *Rubus*; many of them offering suggestions as to the origin of the plant. In the English Botany, Boswell Syme suggests that "it may be a hybrid form, but

I [he] cannot think it probable that the species [*R. Leesii*] is a variety of *R. idaeus*.¹ The theory that the plant is a hybrid was further maintained by William Culverwell, a distinguished authority on hybridization as well as upon the genus *Rubus*. Mr. Culverwell published a figure of a plant, perhaps identical with the round-leaved *R. Leesii*, which he states was produced by crossing the strawberry and raspberry.² One of the main points in the argument for the hybrid origin of the plant was found in the general sterility of its drupes, a condition which, as we shall see, is otherwise satisfactorily explained by Dr. Focke of Bremen.

Among the numerous discussions of the round-leaved raspberry, one in particular is of interest to us. In 1873, Professor Areschoug published a paper entitled, "On *Rubus idaeus*, L.; Its Affinities and Origin."³ In brief, Professor Areschoug's argument was as follows: In Europe *Rubus idaeus* is a unique species, the other fruticose *Rubi* of Europe belonging to the blackberry type, and presenting such a variety of intergrading forms that their specific limitations are very obscure. *Rubus idaeus*, however, differs from all these species in having red or amber berries which separate readily from the receptacle, in having thin bark which scales off from the old canes, and in producing from the root buds which develop into canes. These and many minor points distinguish *Rubus idaeus* from the other European species. Yet this isolated European raspberry varies excessively, a tendency characteristic of genera with many closely related species, but not ordinarily seen in plants isolated from other species of the genus or subgenus. Ordinarily, then, species which have a strong tendency to vary are more or less completely connected with each other—for instance, our American blackberries, or asters. "But *R. idaeus*, L., though greatly variable, produces no intermediate forms connecting it with the other European species, and this circumstance seems to me [Areschoug] to be of such importance that I consider it as belonging to another type."

From the study of material from different regions, Areschoug came to the conclusion that it is "very likely that *R. idaeus*, L., as well as the North American forms most closely related to it, have

¹ Syme, Eng. Bot. iii. 162.

² For detailed discussion see Gard. Chron. n. s. xx (1883) 12, 276, 342.

³ Journ. Bot. xi (1873), 108-115 [translated and revised from Botaniska Notiser, 1872, 168-181].

their origin from species which primitively grew in Japan and adjacent countries." The relations of the European raspberry are undoubtedly with Asiatic and American species, and its closest ally is our common raspberry, *Rubus strigosus*, a species so closely related to *R. idaeus* that the two have sometimes been treated as one. *R. idaeus* is spread over Europe and western Asia and *R. strigosus*, common in North America, grows in Mandschuria and Japan and through Asia to the Altai; so that *R. idaeus* might have been derived from the American *R. strigosus*. Other evidence, however, shows that a large part of the flora of North America originated in eastern Asia,¹ and it is more probable that the European and the American plants had a common ancestor there, the plant with glandless calyx (*R. idaeus*) spreading westward into northern Europe; the other with glandular calyx (*R. strigosus*) crossing Behring Straits to the American continent.

Now the simple form is considered a more primitive stage in leaf-development than is the compound form, so that in *Rubus idaeus*, var. *anomalus*, we have a plant in which the leaves are much simpler in their development than are those of typical *R. idaeus* and the nearly identical *R. strigosus*. After critical study, then, Areschoug, Focke, Babington, and others have concluded that the extremely local round-leaved raspberry of northern Europe is an unusual form of *R. idaeus*, tending, as shown by its short, round leaves, to revert to a simpler ancestral type, and that the plant cannot well be considered a distinct species. This conclusion is well supported by the investigations of Dr. Focke, who says: "I found that the restraining process, by which the form of the foliage leaves was so curiously modified, extended also to the carpellary leaves, and that the axes of these was [were] shortened, so that they did not close and completely envelop the ovules. Of the two ovules in each carpel, one uniformly pined away at a very early stage; the other developed itself during the blooming time in the normal way, but only few carpels were produced. In most cases, however, they dried up whilst the flowering was in progress; and, though some appeared to be fertilized, yet seed entirely failed to ripen. The infertility of the plant I saw, was correlative to the character of its foliage; and we must look upon it as only a curious form of *R. idaeus*, which deviates from the type, so far as the

¹ See Asa Gray, Mem. Am. Acad., n. s. vi.; and extract, "The Flora of Japan," in Scientific Papers of Asa Gray, ii, 125.

form of the leaf is concerned, in the same manner that *Fragaria monophylla* deviates from typical *Fragaria vesca*.”¹

The discovery of this peculiar plant in the Green Mountains is a fact of great significance, and the questions immediately arise, is it truly identical with the European *Rubus idaeus*, var. *anomalus*, or is it a reversion of the similar (if not identical) American *Rubus strigosus*? In one particular alone do the American specimens differ from the European. Among the pubescence on the calyx and peduncles there are some stipitate glands, while the European plant ordinarily has no glands.

Upon this character — the presence or absence of glands — rests the separation of the American *Rubus strigosus* and the European *R. idaeus*. Yet the production of glands, as well as other characters, is very inconstant in the American species. Ordinarily characterized by the glandular calyx, plants are sometimes found with all possible gradations from the glandular to the glandless state. Before me are two numbered specimens of the American plant with absolutely no glands upon the calices — a sheet from Assiniboia, collected in the Cypress Hills by John Macoun (no. 4,550), and another from the Black Hills of South Dakota, collected in Elk Cañon by Rydberg (no. 657). These specimens are, very naturally, called *Rubus strigosus*, Michx., but, were they from European collectors, they would pass without question as *R. idaeus*, L. Other American specimens show strong tendencies toward the European *R. idaeus*. For example, Piper's no. 2879, from Moscow Mountains, Idaho, though with numerous prickles on the calyx, is practically glandless. Often, too, shrubs growing in shade show a strong tendency to lose not only the glands of the calyx but the white pubescence ordinarily characteristic of the leaves. Such tendencies are well illustrated by Piper's no. 2,268, from woods at Spokane, Washington, and by Sandberg, MacDougal, and Heller's no. 259, from rich bottoms in Nez Perces County, Idaho. Similar variations are more or less familiar to all who have watched the American plant in the field. Yet there is, without doubt, a very marked tendency toward the production of glands in the American plant, while the European form is commonly glandless. Maximowicz, following the views of some earlier authors, has treated the American and Asiatic plant as a variety of the European (*R. idaeus*, var. *stri-*

¹O. W. Focke, Journ. Bot., x. 27 [translated from the Oesterreichische Botanische Zeitschrift, 1870, 98].

gosus, Maxim.¹), and there is little doubt that the relationship of the plants is thus more truly presented than by the forced separation of them as specific types. The extreme tendency, as seen in the American plant, to variation not only in leaf but in the degree of gland development, is sufficient to suggest that Maximowicz may be too liberal in his treatment of the glandular plant, for, if in the open one can find the glandular form, and near by, in shade, numerous variations to the glandless state, the recognition of the American plant, even as a geographic variety, seems scarcely warranted.

Nevertheless, whether we regard the two plants as representing mere phases of a polymorphous species, *R. idaeus*, or as somewhat characteristic geographic varieties — the glandular extreme encouraged by the dry atmosphere of the American continent, the glandless one by the moister atmosphere of northern Europe — there is little doubt that they are practically one species. And although the round-leaved plant of the Green Mountains bears upon its calyx more glands than are usual in the European plant, there seems little reason to distinguish it as another variety. That the variable American plant with glandular calyx should occasionally produce a sport parallel with the glandless European var. *anomalus* is possible, and such extreme variations may be looked for with some confidence.

But, in the case of the Cavendish station, it seems not improbable that the plant had the same geographic origin as the colonies in northern Europe, for, at the same station, at least one other plant is known which is far removed from the broad range of its species. There, as already mentioned, is found *Arenaria macrophylla*, a species characteristic of the mountains of our Pacific slope, though occurring also at isolated stations on the Great Lakes and in Labrador. The small *Rubus* at Cavendish, then, is associated with a plant, which, with little doubt, was established there during the northward march of the vegetation at the close of the Glacial Period; and it is reasonable to suppose that the *Rubus*, formerly growing in circumpolar regions, was forced south by the southward extension of the ice, most of the plants² following the meridians which pass through northwestern Europe, but a few following down this side of the Atlantic; and now a remnant of

¹ Bull. Acad. Sci. St. Petersburg, xvii. (1871), 161.

² Although this plant ordinarily produces no fertile drupes, according to Babington (Jour. Bot. xvi. 85) occasional good seed are formed — probably enough to have spread the plant to its few scattered stations.

the ancient American colony persists in this sheltered situation in Vermont, as does *Arenaria macrophylla*, and as, in better known stations, do *Diapensia lapponica*, *Cassiope hypnoides*, and scores of other plants of more northern origin.¹

If this be the true explanation of the source of the Cavendish colony of *Rubus idaeus*, var. *anomalus*, the plant must have occurred among the Green Mountains for thousands of years; but that it is extremely local and scarce is obvious from the fact that it has remained unobserved upon this continent until the present year. This extreme scarcity of the plant, in a region where the climatic conditions seem favorable, is probably due to the usual sterility of the drupes as emphasized by the European authors who have studied the plant, and as likewise observed by Mr. Eggleston at the Vermont station.

If, on the other hand, the Cavendish plant is considered a reversion of the glandular *Rubus strigosus*, we are adding nothing to the argument that the American and European species are distinct, for, if the two plants produce occasional sports so similar as to be undistinguishable, we have fair evidence of their common ancestry if not identity. In view of the extreme inconstancy of the glandular character of the two plants — the chief character relied upon to separate them — it seems best to consider our American *R. strigosus* specifically identical with the European *R. idaeus*, and to treat the small round-leaved variety from the Green Mountains as *R. idaeus*, var. *anomalus*.

GRAY HERBARIUM.

Explanation of Plate 20. *Rubus idaeus*, L., var. *anomalus*, Arrhenius, drawn from a Vermont specimen by C. E. Faxon.

COMMELINA VIRGINICA ESTABLISHED IN NEW ENGLAND. — *Commelina Virginica*, recorded in the Manual as occurring from New York southward, has now for some years maintained itself perfectly in several parts of Providence, coming up each year and blooming profusely. It escapes from hot houses and winter gardens. — W. W. BAILEY, Brown University.

[In some places about Boston and Cambridge, this *Commelina* has persisted for years in damp yards and in waste ground. — ED.]

¹ See RHODORA, ii, 138-139.

FURTHER NOTES ON THE FLORA OF WORCESTER COUNTY, MASSACHUSETTS.

C. H. KNOWLTON.

DURING the past year I have collected extensively about Webster, one of the southern towns of Worcester County, Massachusetts. The results have been very satisfactory. Thompson, Conn., joins Webster, and also affords an interesting botanical field. I have been greatly assisted in observation by Mr. L. J. Spalding, of Webster, and have frequently compared notes with Mr. R. M. Harper, of Southbridge. Mr. Joseph Jackson's County Flora, has also been of great assistance. The asterisk indicates plants not included in that work.

* *Ranunculus repens*, L. Thoroughly established in and around a brook at East Webster. This crowfoot is rare in interior Massachusetts, and may be introduced.

Xanthoxylum Americanum, Mill. This grows abundantly in Thompson, Conn., near the state line, and it is to be expected in Massachusetts. In Worcester County it has been reported only from Millbury.

* *Rubus setosus*, Bigelow. Low thicket, East Webster.

* *Lythrum Salicaria*, L. Muddy shores of the Quinebaug and Maanexit rivers, Dudley and Oxford, in great abundance. Not considered common in central Massachusetts.

Circaea alpina, L. Cold woods. Purgatory Chasm, Sutton, also Athol. Very local in the county.

Cornus circinata, L'Her. Rich woods, Douglas and Sturbridge.

Linnaea borealis, L. Common, Royalston and Athol. Previously reported from Gardner and Templeton, and to be expected throughout the northern towns of the county.

* *Aster vimineus*, L., var. *foliolosus*, Gray. Dry fields, Webster. The type is common.

Rhododendron viscosum, Torr., var. *glaucum*, Gray. Rich woods near a brook, Dudley, not far from the Charlton line, but a considerable distance from the station where it was reported by R. M. Harper. (RHODORA, ii, 122.)

Limnanthemum lacunosum, Griseb. Shallow water, Whiting Pond, Northbridge. Though not much known in Worcester County, it is to be expected in any pond where the level has not been too much altered.

Gratiola Virginiana, L. Wet place in a clearing, Sutton. Previously reported from Lake Quinsigamond.

Polygonum Muhlenbergii, Watson. Shallow water of Maanexit River, North Webster. Very local in the county.

Polygonella articulata, Meisn. Roadside, Dudley. Apparently frequent in the towns of the southern border.

Betula papyrifera, Marshall. Occasional in rich woods, Webster, Dudley. Not common in the southern towns of the county.

Abies balsamea, Miller. Although supposed to be restricted to the northern towns of the county, small trees (not fruiting) occur in Webster and Dudley.

Taxus Canadensis, Willd. Abundant in deep woods, Royalston. Previously reported from Worcester.

* *Scirpus subterminalis*, Torr., var. *terrestris*, Paine. Abundant in a small pond in Dudley (altitude 540 feet), September 9, 1899. The pond is a part of a reservoir system, and, owing to a drought, its water had been largely drawn off. The conditions were thus favorable for the development of this interesting form, which is not likely to persist. Previously reported only from Herkimer County, N. Y.

* *Rhynchospora alba*, Vahl. Sandy shore of brook, Webster. From this and Mr. Harper's observations, the species seems to be rather frequent in southern Worcester County.

* *Cladium mariscoides*, Torr. Sandy swamps, Webster. Reported from Brookfield and Sturbridge.

* *Panicum filiforme*, L. Sandy field, Oxford. Previously reported only from Brookfield.

* *Panicum proliferum*, Lam. Abundant around a small pond, Dudley. Reported from Brookfield.

* *Panicum virgatum*, L. Sandy swamp, Webster. Reported from Brookfield.

* *Aristida gracilis*, Ell. Roadside, with *A. dichotoma*, Webster. Reported from Sturbridge.

* *Woodwardia Virginica*, Smith. Swamp near R. R. track, Douglas. Reported from Webster.

* *Botrychium matricariaefolium*, Braun. Dry thicket near Purgatory Chasm, Sutton. Very local.

CHELMSFORD, MASS.

SOME NEW ACQUAINTANCES.

WILLIAM P. RICH.

THE plant-hunter whose range of observation is restricted by the force of circumstances to a distance of not more than a day's journey to and from his home, and more often to a half-day's outing, gradually finds that his well-gleaned fields no longer offer him the novelties which once rendered buoyant his steps and cheered the long homeward walk with pleasing anticipation of what some new discovery would prove to be. After several excursions in which nothing new is added to his lists, however interesting and profitable they may be in other ways, his waning interest is one day suddenly revived, and his enthusiasm rekindled, as he comes across not only one new plant, which ordinarily would be satisfactory enough, but upon a numerous company of weeds, many of which he has never before seen. They prove to be a colony of recently introduced plants, and although these newcomers are regarded by some as of little account, and stigmatized as interlopers and vagrants, they are welcomed by the local botanist, affording him glimpses of the vegetation of distant regions which he can never expect to visit.

These enterprising plants, not contented with the means furnished by nature for their dissemination, have in these later days taken to travelling by rail. They suddenly appear in vacant lots around freight yards, along railway banks, and on city dumps, with perhaps the best intentions of settling down for a permanent residence and the praiseworthy purpose of covering unsightly places with their verdure. Their reception, however, is not very cordial. The hand of man is against them, and they do not tarry long with us. The space they occupy is wanted for other purposes, and, like the Wandering Jew, they are soon forced to move on; their coming and their going noted, however, with pleasure by the few observers interested in such things.

A company of these tramps of the vegetable kingdom has during the last three years taken up a temporary abode on a railway bank at Dedham, Mass. Here they have flourished luxuriantly during the summer until the annual mowing of the weeds in August by the railway men, to which has been added the present year the burning over of the locality, so that it is probable that most of these chance visitors will be found here no more. In view of the certain extirpation of this interesting botanical settlement, many of the species having already

succumbed to the fierce attacks made upon them, a record of some of the plants found here may be of value.

Salsola Kali, L., var. *Tragus*, Moq. (the Russian thistle). This was first observed here by the writer, August 22, 1897, when two bushy plants about a foot high were seen. It has since shown a tendency to increase, twenty plants having been counted the present season, August 4, a few of them three hundred feet distant from the original location. The plants first seen were quite different in general appearance from *Salsola Kali*, the seashore species. They were bushy-upright, their slenderer, greener leaves and stems contrasting strongly with the decumbent, coarse, succulent plant of the seashore. Later plants, however, seem to have changed their habit somewhat, by becoming more prickly and prostrate, and now as it grows along the gravelly railway track does not appear so very different from the species of which it is probably only a variety. In this connection it may be stated that in the *Journal de Botanique*, 1887, p. 281, M. Constantin records the fact that when *Salsola Kali* grows along river banks away from the sea it loses the fleshy character of its leaves and passes into the var. *Tragus*. This locality, with the one reported in RHODORA, Vol. I, p. 47, by Mr. J. F. Collins, at Providence, R. I., appear to be the first records of the arrival in New England of this western pest.

Bidens bipinnata, L. (Spanish Needles), was found growing abundantly on the occasion of a visit made October 2, 1898. Its tufts of prickly-barbed awned akenes made it a conspicuous object amidst the other plants. It was apparently of short life here, none having been seen by the writer since.

Ambrosia trifida, L. (Great Ragweed). Numerous plants of this species, some of them attaining a height of seven feet, have been seen on every visit during the last three years. It presents a striking appearance, with its large three-lobed leaves, and, although coarse and rough, it is an interesting plant when seen for the first time. Although pronounced common in the Manuals, it is a rare plant in eastern Massachusetts, occurring only on waste ground, where it is doubtless introduced from the West.

Xanthium strumarium, L. (Cocklebur). A few plants of this not very common species were seen in mature fruit, October 2, 1898. It is easily distinguishable from the much more common and similar plant, *Xanthium Canadense*, Mill., by its smaller bur, which is at

maturity about one half the size of the latter, and by its nearly glabrous surface, the bur of *X. Canadense* being densely hispid. *Xanthium spinosum*, L. (Spiny Clotbur) was also noticed here.

Chenopodium ambrosioides, L. (Mexican Tea). Never before has the writer seen hereabouts what could unhesitatingly be pronounced this species. Its very leafy spikes, nearly entire upper leaves and repand lower leaves, presenting a different looking plant from the one with naked elongated spikes and coarsely toothed leaves known as the var. *Anthelminticum*, Gray, which is so common on waste grounds around Boston. There were, however, some plants growing with it of an intermediate character, showing that the two plants are not specifically distinct.

Sisymbrium altissimum, L., was very abundant the present summer. When mature it loses all its leaves, leaving only a mass of long, stiff, slender pods, which stand out in all directions from the stem and branches.

Berteroa incana, DC. (Hoary Alyssum). This grows abundantly on a grassy bank and along the roadside in the immediate vicinity of the railway.

Conringia perfoliata, Link., which escaped the notice of the writer, was collected here June 27, 1897, by Mr. E. F. Williams.

Verbena bracteosa, Mich. Two specimens of this western plant were collected August 4.

Hibiscus Trionum, L. (Bladder-Ketmia), a branching annual with an inflated calyx, was also among the strange plants found.

In addition to the above list, nearly all of which were collected by the writer for the first time, there were noted the following plants that are more commonly found in this part of the State:

Cenchrus tribuloides, L., *Echinosperrum Lappula*, Lehm., *Lithospermum arvense*, L., *Stachys palustris*, L., *Ricinus communis*, L., *Galeopsis Tetrahit*, L., *Solanum rostratum*, Dunal., *Amarantus blitoides*, Watson, *Artemisia vulgaris*, L., *Lactuca Scariola*, L., *Galinsoga parviflora*, Cav., var *hispida*, DC., and *Lechea maritima*, Leggett.

NOTES ON TWO RARE ALGÆ OF VINEYARD SOUND.

R. E. SCHUH.

THE following notes are offered in a somewhat extended form, in the hope that by calling attention to these species their known range may be considerably enlarged.

Giraudia sphaclarioides, Derb. and Sol., has been so confidently sought on our coasts that Dr. Farlow, twenty years ago, in the *Marine Algæ of New England* (p. 75), gave a brief description of it. Yet no one seems to have discovered it until I found a well-grown, but sterile, specimen at Vineyard Haven, in August, 1892. Nothing more was seen of it until fruited forms were collected at Cottage City in January, 1895. It then occurred sparingly on *Zostera*, intermingled with *Punctaria*, *Ectocarpus*, and various small species. It is easily overlooked, as it is but 5 to 10 mm. high, and usually only a few filaments are found together. It may readily be recognized by having a thallus which is polysiphonous above and monosiphonous below. A figure, copied from Hauck, is to be found in Bennett and Murray's *Cryptogamic Botany*, p. 238. As this is a common Mediterranean species, it should be sought late in autumn in Long Island Sound and in Rhode Island waters.

Pogotrichum filiforme, Reinke. This small alga was a most surprising find in our waters. It was before only known to occur rarely at Helgoland, where it was collected by Reinbold. It is described and figured by Reinke in his *Atlas Deutscher Meeres-Algen*, p. 62, pl. 41, figs. 13-25. In January, 1895, three fertile and unmistakable specimens, bearing unilocular sporangia, were found at Cottage City. It was then growing on *Zostera*, in company with *Desmotrichum*, *Giraudia*, and various small species. The specimens distributed in Hauck & Richter, *Phycotheca Universalis*, No. 470, are about 40 mm. high; our forms are dwarfed to one tenth that size, but otherwise correspond closely with the type. The plant consists of several fine filaments (arising from a thin substratum), which are composed usually of a single series of quadrate cells, .015-.030 mm. wide. Occasionally these may be divided, so that for a short space two or more series may be found side by side. The European specimens are olive-brown, but ours are almost hyaline, except for a space along the center of the filaments, where the darker spores are borne singly in superficial cells which surround the underlying thallus so closely that

it is entirely hidden. The plurilocular sporangia may be recognized by their resemblance to those of *Ectocarpus*. The identification of our specimens is due to the courtesy of Professor Farlow.

Since these notes were in type another very small specimen of *Pogotrichum filiforme* has been discovered, which shows that this interesting form still persists in New England. It occurred now upon *Sertularia pumila*, Linnè, among *Sphacelaria*, upon a bit of *Ascophyllum* which also harbored *Clava leptostyla*, Ag., a hydroid which is rather common on the *Fucaceæ* at low water mark on exposed shores. I am informed by Mr. G. W. Gray, Curator of the Marine Biological Laboratory, that the specimen in question was collected at Woods Hole about the end of last October. Since Vineyard Sound is a waterway used by many foreign vessels, it is not improbable that this plant is merely a waif from alien waters. Possibly future collections may cast light upon this interesting question.

BRISTOL, R. I.

PLANTS FROM THE DUCK ISLANDS, MAINE.

EDWARD L. RAND.

THE Duck Islands, two in number, and small in area, lie seaward about ten miles off the coast from Southwest Harbor, Mt. Desert Island, Maine. The smaller island, Little Duck, is high, poorly wooded, partly cleared, and uninhabited. From a botanical point of view it is little explored. The larger island, Great Duck, is divided by a marshy depression from north to south, and is mostly cleared, but has some old woods still remaining. It is now the site of a lighthouse, and therefore inhabited by others besides the fishermen who often make temporary summer homes on both islands. Before the lighthouse was built, however, it had been long inhabited, until fire destroyed the farmhouse and forced the settler to make a home elsewhere. Sheep now graze over a large part of this island, and, as usual, make collecting most unsatisfactory to a botanist.

Some years ago, the late John H. Redfield, while engaged in work on the flora of Mt. Desert, considered the plants of these small outlying islands of sufficient interest to warrant the compilation of a list, as he from time to time observed them. Two lists were published by him in the Bulletin of the Torrey Botanical Club, xii : 103

(1885), and xx: 409 (1893). These lists are of course far from complete, and represent only the results of a few short visits to the islands.

All visits are necessarily short, for access to the islands is difficult for many reasons, and landing on the rocky shores is uncertain at any time. It is only therefore by a compilation of the results of a number of these hurried botanical observations that sufficient information can be obtained concerning the plants found there for comparison with those of the inner islands, and of the mainland. The following list represents the plants, not contained in Mr. Redfield's lists, found by me during a short visit made last summer, with the addition of a few plants found at other earlier visits.

It may be said that thus far *Cerastium arvense* and *Montia fontana* are the most interesting plants discovered on these islands. The former plant, although common on Great Duck, is unknown elsewhere in the region, and doubtless was introduced by some cause. The latter plant is unknown elsewhere in the eastern United States except on Great Cranberry Isle, some miles further inshore.

It should be here noted in regard to Mr. Redfield's lists that *Polygonum incarnatum* there recorded, is an error; and that for *Prenanthes alba*, we must probably read, *Prenanthes serpentaria*, Pursh. These corrections were made by Mr. Redfield himself at the time of preparing the Flora of Mt. Desert for publication.

<i>Cardamine parviflora</i> , L.	<i>Vaccinium Oxycoccus</i> , L.
<i>Cakile americana</i> , Nutt.	<i>Galeopsis Tetrahit</i> , L.
<i>Viola blanda</i> , Willd.	<i>Plantago major</i> , L.
<i>V. lanceolata</i> , L.	<i>Atriplex patulum</i> , L.,
<i>Stellaria borealis</i> , Bigel.	var. <i>hastatum</i> , Gray.
<i>Buda borealis</i> , S. Wats.	<i>Polygonum Hydropiper</i> , L.
<i>Geranium Robertianum</i> , L.	<i>Urtica gracilis</i> , Ait.
<i>Lathyrus maritimus</i> , Bigel.	<i>Microstylis ophioglossoides</i> , Nutt.
<i>Rubus triflorus</i> , Richards.	<i>Pogonia ophioglossoides</i> , Ker.
<i>Fragaria virginiana</i> , Mill.	<i>Zostera marina</i> , L.
<i>Potentilla littoralis</i> , Rydberg.	<i>Eleocharis palustris</i> , R. Br.,
<i>Lonicera caerulea</i> , L.	var. <i>glaucescens</i> , Gray.
<i>Aster Novi-Belgii</i> , L.	<i>E. tenuis</i> , Schultes.
<i>A. nemoralis</i> , Ait.	<i>E. acicularis</i> , R. Br.
<i>Taraxacum erythrospermum</i> ,	<i>Eriophorum vaginatum</i> , L.
Andrz.	<i>E. virginicum</i> , L.

<i>Carex rigida</i> , Gooden.,	<i>Agrostis alba</i> , L.,
var. <i>Goodenovii</i> , Bailey.	var. <i>vulgaris</i> , Thurb.
<i>C. maritima</i> , O. F. Mueller.	<i>A. alba</i> , L.,
<i>C. Magellanica</i> , Lam.	var. <i>stolonifera</i> , Vasey.
<i>C. flava</i> , L. var. <i>viridula</i> , Bailey.	<i>Calamagrostis canadensis</i> , Beauv.
<i>C. sterilis</i> , Willd. (forms)	<i>Danthonia spicata</i> , Beauv.
<i>C. canescens</i> , L.	<i>Poa compressa</i> , L.
<i>C. trisperma</i> , Dewey.	<i>P. pratensis</i> , L.
<i>C. straminea</i> , Willd.,	<i>Osmunda cinnamomea</i> , L.
var. <i>aperta</i> , Boott.	

THE MARINE FLORA OF GREAT DUCK ISLAND, ME.

F. S. COLLINS.

THE location and character of the Duck Islands are indicated in another article in this number of RHODORA, by Mr. Rand, with whom I visited Great Duck Island last July. While he was investigating the land flora, I gave my attention to the marine flora, and that it is interesting may be inferred from the fact that I did not once step above high-water mark, though I was among the first to land and the last to re-embark. The shore near the landing point shows a nearly horizontal stratification, with a slight upward slope seaward. There is thus formed a series of terraces, each with a shallow pool along its inner half. The bottom and sides of these pools are richly coated with algae, and the general development of the flora here is more luxuriant than on Mount Desert Island itself, even at exposed points. Why a small outlying island should have a more luxuriant flora than an exposed part of a larger island or of the mainland, it is hard to say; but on the New England coast, at least, this seems to be the case.

Perhaps the most striking feature here was *Ralfsia deusta* J. Ag., carpeting the bottoms of pools, sometimes in patches more than a square meter in extent. This is a characteristic northern species, its extreme southern limit on this coast being Nahant, Mass., and I had never seen it so luxuriant as here. Those who know it only from dried, shrunk, uniformly dark brown herbarium specimens, have no idea of its beauty when growing. It consists of horizontal, overlapping, fan-shaped fronds, radiately striate and concentrically zoned in

shades of brown and yellow, lightest at the margin, sometimes reminding one of a small and delicate Polyporus. Under this surface of vigorous fronds is a thick mass of old, overgrown fronds, the lowest practically a structureless mass. Probably many years' growth is needed to produce one of these thick carpets. Though all the other species of this genus fruit abundantly, the fructification of this species is yet to be discovered, and the Duck Island specimens, for all their luxuriance, show nothing but vegetative growth.

Turning from a rare and local species to a widely distributed and very common one, *Polysiphonia urceolata* (Lightf.) Grev. presents a curious form here. I can find nothing in the many descriptions of this plant in regard to a creeping base; but here it formed dense mats of rooting filaments, from the centre of which arose the well-known vertical tufts. Where only the prostrate filaments occurred, no one would suspect, without careful examination, that the brownish circular disk, a few centimeters in diameter, belonged to this common species.

Laminaria platymeris De la Pyl. also shows different characters here from what it has in some other places. As noted by Setchell,¹ in Massachusetts bay it is epiphytic on the larger Laminarias; but here it grows on the rock sides and bottoms of the larger pools.

In less than three hours' time, within a stone's throw of the point of landing, I noted sixty-one species and two varieties of algae. Notice of microscopic forms was out of the question; but if we make a fair allowance for them, for plants preferring the different character of shore which occurs in other parts of the island, and plants to be found at other times of the year, the number given would probably be doubled. It is therefore hardly worth while to give a list as incomplete as our present must be. The Laminariaceæ were strongly represented, both as to species and individuals, and there were five species of *Fucus*. The general brown aspect that these large plants gave to the region was relieved by the green of *Cladophoras* of the *Acrosiphonia* group, and the pink and white of *Corallina* and *Lithothamnion*. Most of the red algae were dull colored, but there were some superb broad fronds of *Rhodomenia palmata* (L.) Grev., half a meter in length, each frond full of tetraspores throughout; while small, but bright, fronds of *Polysiphonia urceolata* (Lightf.) Grev., and of *Gloiosiphonia capillaris* (Huds.) Carm., lighted up the shallow pools.

¹ Rhodora, Vol. II, p. 143.

The thoroughly northern character of the flora made a hasty visit tantalizing; one felt that a longer stay might be rewarded by some of the curious forms that Rosenvinge has found at Greenland, many of them growing on host plants that abound here.

POGONIA PENDULA IN MAINE.

LE ROY HARRIS HARVEY.

WHILE on an extended collecting trip along the western border of Maine, in the fall of 1899, the writer in company with a botanical friend, climbed Frost Mountain for the purpose of obtaining specimens of the maiden-hair spleenwort, *Asplenium Trichomanes*, L.; the ebony spleenwort, *Asplenium ebeneum*, Ait., and the rusty Woodsia, *Woodsia Ilvensis*, R. Br.

Frost Mountain, having an altitude of about 3600 feet, is situated in the town of Brownfield, forty miles northwest of Portland, ten miles south of Fryeburg, and five miles from the New Hampshire line. The ascent was made on the southwestern slope. Nearly half way up we passed through a ravine-like depression covered with hard growth, mostly beech. As we mounted the further slope of this ravine, we simultaneously uttered exclamations of surprise, and hastened forward to examine more closely our find, which we readily recognized as *Pogonia pendula*. Growing in an isolated clump, were four specimens — three well developed and one aborted. The plants were firmly rooted in a bed of leaf mould over granite formation. Two of the plants were carefully dug up for our herbaria, and the others left, as we hoped thus permanently to maintain the locality. We searched very carefully over the immediate slope, but to no avail.

This is the first time the nodding pogonia, *Pogonia pendula*, Lindl. has been reported east and north of Lake Winnipiseogee, N. H., and is the fourth authentic locality in the New England states.

I append the following data, which have been kindly put at my disposal by Mr. Emile F. Williams of Boston, who is compiling a check-list of our New England orchids.

Mr. Williams has examined, to date, the following herbaria — Gray; Brown University; W. P. Rich, J. R. Churchill, C. E. Faxon, Boston; G. G. Kennedy, Milton; Walter Deane and M. L. Fernald, Cambridge; C. H. Bissell, Southington, Conn.; J. F. Collins and W. W.

Bailey, Providence — and has found in them only a single specimen of *Pogonia pendula*, this being in the Gray herbarium, collected by Prof. D. C. Eaton at New Haven, Conn. No data further than locality were given. Mr. F. W. Batchelder exhibited, at a meeting of the New England Botanical Club in 1899, a specimen collected from a large patch on the shores of Lake Winnipiseogee. In Mr. Williams's herbarium are two specimens collected by Mrs. Walker at Wilton, N. H., on the fifteenth day of August, 1899. The specimen in the writer's herbarium bears the date, August 15, 1899, being the exact date of the collecting of the specimens in Mr. Williams's herbarium.

Baldwin gives *Pogonia pendula* as being found in three towns in New Hampshire, one in Vermont, four in Massachusetts, one in Rhode Island, and five in Connecticut. It is very doubtful, however, whether Mr. Baldwin saw specimens from the above localities, as many of his records were based upon unverified reports.

Careful search along our New Hampshire border ought to reveal several more localities for this beautiful and somewhat rare orchid.

UNIVERSITY OF MAINE, Orono.

TO FERN COLLECTORS. — Having now taken up my manuscript for a Text-Book and Synopsis of the Ferns of North America, planned in 1880, with the intention of revising and completing it for publication, and wishing to fill out more completely the Distribution Tables published in the Transactions of the Philosophical Society of Philadelphia for February, 1883, I should be glad to receive from any one accurate lists of ferns known positively to grow within the limits of their states or vicinities.

Specimens for verification, and vouchers, are also desired and will be returned to sender whenever requested. — GEORGE E. DAVENPORT, 67 Fellsway West, Medford, Mass.

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